

# Energy Services **BULLETIN**

Western's monthly energy efficiency and renewable energy newsletter dedicated to customer activities and sharing information on energy services.

## Future looks green for Fowler, Colo.

**F**aced with rising energy prices and an aging population on fixed incomes—problems familiar to rural communities across the country—the city of Fowler, Colo., has responded by turning itself into a laboratory for sustainability.

Energy self-sufficiency using local wind, solar and biomass resources may hold the key to the city's long-term growth and economic viability. "In the last year, our electricity rates went up 9.8 percent, and another 15 percent rate hike is likely in the near future," explained City Manager Wayne Snider. "That sort of thing can be ruinous to someone on a fixed income. So we decided that the town needed more control over its energy supply. Saving our residents money—that was really the main motivation. Things just took off from there."

### Lots of wind, sun

The town council began looking at renewable energy projects that could stabilize, and then reduce Fowler's utility rates, and realized that they might have the resources to eventually

leave the grid entirely.

On the southeastern Colorado plains, Fowler is blessed with abundant wind and solar resources. Western's Equipment Loan Program loaned the town an anemometer to collect wind data at Windy Point, north of Fowler. The site's Class 4 wind resources could support three 700-kW turbines, to start.

Small scale distributed solar power has already come to Fowler in the form of residential installations and solar LED streetlights in the city park. The lights, funded by Great Outdoors Colorado, reduce the city's electricity use, if not its costs. Fowler's contract with primary power provider Black Hills Power is a flat fee franchise. Renegotiating that contract would improve the city's payback from the 600 kW of solar panels being installed on its municipal buildings this summer.

The R4 School District also hopes to go solar, with either photovoltaic panels or SunCube concentrated solar technology. The state's new solar gardening legislation may open the door to another 2 megawatt's worth of solar development. "We have a site south of town and we have financing lined up," said Snider. "When the Public Utilities Commission (PUC) finalizes the rules and regulations, we will be ready to build."



**The city of Fowler is one of four cities participating in the Sustainable Main Street Initiative to support community projects such as improving energy efficiency in the downtown area. (Photo by Bill Gray, Department of Local Affairs)**

While the city works with the PUC to clarify the requirements for a solar garden, Snider is meeting with the Colorado Association of Municipal Utilities to learn more about billing issues, software and other details that affect cost.

### Waste to energy

Those aren't the only renewable resources available to the city, either. Feedlots within a 20-mile radius of Fowler produce 24 tons of manure daily. Processing that manure in an anaerobic digester could produce enough methane to generate 1 to 4 MW. Stewart Environmental Consultants, in conjunction with Colorado State University (CSU) in Fort Collins and Pueblo, built a pilot digester at the Rocky Ford Feed Yard and will soon complete construction on a mobile digester unit. "The mobile unit can be used to fine tune the

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## Fowler, Colo. *from page 1*

mix, and demonstrate the concept to feedlot owners,” said Snider.

Another potential energy source is algae from the city’s wastewater lagoon that could be added to the anaerobic digester or processed into biochemicals or biofuel.

In addition to producing power, both projects have a waste management aspect. The wastewater plant currently discharges the algae, and farmers spread the unprocessed manure as fertilizer. “But digestate is a much higher quality fertilizer with less odor,” Snider explained.

He added that the state Department of Public Health is very supportive of the biofuel projects because of their potential to improve air and water quality.

### Starts with a school

Fowler’s sustainability plans developed so quickly, it is hard to believe that one building project put them into motion.

In 2007, the school district sold the town the Park Elementary School for \$1 to use as the new city hall. Fowler needed the facility to house city offices, but the cost of renovating

and operating the 1905 structure was prohibitively expensive. “We realized that we couldn’t afford to power the building on utility rates, and those weren’t going down,” said Snider.

In exploring their alternatives, the town council discovered that the old school building wasn’t the only place where renewables could save the city money. Once renewable energy was on the table, a host of related issues came with it: siting, city growth, energy efficiency, greenhouse gas emissions, economic development. Each of those issues held an opportunity to make Fowler a better place—if the city had a plan.

Enlisting the Rocky Mountain Land Use Institute at the University of Denver, Fowler developed the Rocky Mountain Land Use Plan. Projecting the city’s needs through 2035, the plan provides an outline for increasing livability without increasing the city’s carbon footprint. Developing renewable energy, reviving Main Street, improving energy-efficiency citywide and creating jobs are just a few of the issues the plan addresses.

### Don’t go it alone

The school project and the planning process showed the town council that partnerships were the way to turn plans into action. To fund the school’s rehabilitation, the town entered into a performance contract with the Colorado Historical Society State Historic Fund and the Governor’s Energy Office (Recharge Colorado).

The state recently selected Fowler as one of four cities to participate in the Sustainable Main Street initiative. To be chosen, cities had to complete or undertake a sustainability plan—a requirement Fowler already had covered.

The initiative supports commu-

nity projects ranging from increasing disaster readiness plans to improving energy efficiency in downtown areas to preserving their cultural integrity.

“As part of the program, we will be doing energy audits of our downtown buildings, and developing plans to make the area more walkable,” said Snider. “We would also like to develop a new trail system by the Arkansas River.”

### More partners

A web of public-private partnerships has covered a large portion of the cost of Fowler’s renewable energy projects, and goes beyond financing in some cases. A portion of the sludge produced by the nearby city of Pueblo’s water treatment plant now goes into Fowler’s anaerobic digester. Adding the sludge improves the unit’s performance, while reducing what the larger city must send to the landfill.

Vibrant Solar, Inc., the contractor building Fowler’s municipal solar installations, will sell the solar power to the city at half the price of Black Hills power. In turn, the solar company will get about \$440,000 in rebates and \$40,000 in energy credits over the next 20 years from the utility, which will apply the generation to the state’s renewable energy mandate. “Black Hills, Xcel and Tri-State [Generation and Transmission Association] have all been very helpful,” Snider said of the utilities that serve the city and the surrounding area.

Helios LLC, a sister company of Vibrant, is looking at building \$20 million in solar manufacturing facilities in Colorado. Economic development authorities throughout the state offered proposals, including Fowler. Things look good for the

*See FOWLER, COLO., page 8*

### Energy Services Bulletin

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# Video game investigation turns student into energy detective

**S**uddenly, everyone wants to be an energy detective. Inspired by the The Great Refrigerator Robbery, Energy Services Representative Paula Fronk and her son Brady undertook the investigation of another common household energy consumer—the video game system.

This was an intriguing proposal, given that video game consoles are now in more than 40 percent of all homes in the United States. The Natural Resource Defense Council estimates that video game consoles consume about 16 billion kilowatt-hours each year—roughly, the electricity annually used by the city of San Diego. These deceptively small but greedy energy thieves are driving up electric bills, particularly in homes with multiple game systems or gamers.

## Gaming teaches science

Brady is the only gamer in the Fronk household, but anyone who knows 13-year-olds will tell you that one can rack up plenty of hours at the console. Paula said that her son has more than 130 games and three different types of consoles. “He earned them all by getting good grades,” she noted.

Besides gaming, Brady has a keen interest in science—he attended a science and technology high school in Salt Lake City. That’s why Paula, who works in Western’s Colorado River Storage Project Customer Service Center (CRSP), took her son to the Utility Energy Forum (UEF) in 2009. During the presentations, Brady asked a lot of questions, including some that stumped the speakers. “He wanted to know which gaming consoles saved the most energy and other things about the systems’ operation,” Paula said. “No one had immediate answers for him.”

That’s when Equipment Loan Manager Gary Hoffmann, who has a hidden talent for energy education, came up with the idea of Brady testing the game systems himself. Brady liked the idea of doing a science project that could contribute to a greener future, and also involved playing video games (gaming as it’s known to the community of gamers.)

From the Energy Services point of view, the investigation could turn into a timely fact sheet for Western customers and a catchy poster for the 2010 UEF. The project might also encourage customers to borrow tools from the Equipment Loan Program to teach kids about conserving energy.

## Assembling our team

So Paula deputized Brady as a special agent energy detective, and the project began with a conference call. “I was really impressed with the way Brady jumped in with questions and ideas for the project,” she recalled.

Next, we had to select the tools that would catch our energy thieves red-handed. Gary picked the Kill-a-Watt power meter and the Fluke Ti10 infrared camera, both designed for consumer use. The Watts Up power meter would have provided more detailed data, explained Hoffmann, but it has to be downloaded to a computer. “We wanted Brady to be able to focus on collecting data and not on figuring out how to use the tools,” he explained. “Customers often borrow Kill-a-Watts for classroom demonstrations and send them home with students to plug into home appliances.”

The IR camera was not as critical to the video game investigation as it was for the refrigerator caper, added Hoffmann. “It just made a visual



**Special Agent Brady Fronk conducts surveillance on video game consoles suspected of grand theft energy.**

point—showing Brady that the game is generating heat, and that heat is wasted energy.”

Brady added that he already suspected waste heat because one of the Fronk cats likes to sleep behind one of the consoles.

## Laying the trap

Equipped with the right tools for the job, Paula and Brady set out to design the investigation. First they rounded up the suspects:

- Console 1 – Includes DVD-ROM, Cell Broadband Engine processor, 256-MB RAM, 80-GB hard disk drive, external game pad, wireless. Game tested: Civilization Revolution
- Console 2 – Includes DVD-ROM, 3.2-GHz IBM PowerPC 3 cores processor, 512 MB RAM, 120-GB hard disk drive, 10 MB-integrated video adapter memory, 16-bit

*See INVESTIGATION page 4*



## Investigation

from page 3

Surround Sound, external game pad, wireless, external power adapter. Game tested: Halo Wars

- Console 3 – Includes IBM PowerPC processor, 512 MB RAM, Flash memory card, wireless, remote-control joystick. Game tested: Sports Resort

As with the refrigerator project, the purpose was not to single out any particular brand, but to look at how different features affect energy consumption.

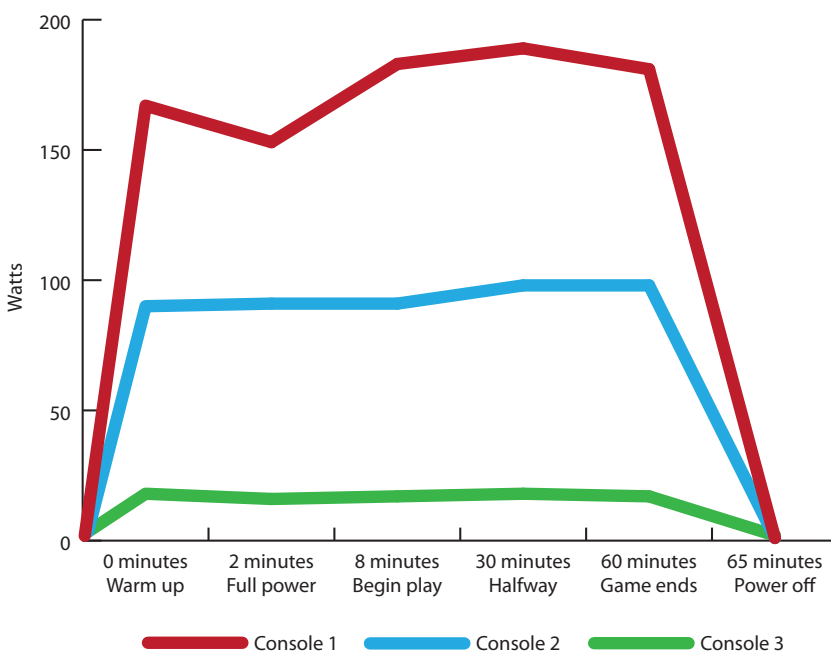
### Collecting evidence

Each session included a pre-game movie a few minutes long and one hour of play. The Kill-a-Watt measured only the consoles' electricity use, not the power consumed by the flat-screen television that served as a monitor.

Upon connection to the Kill-a-Watt, the consoles showed a slight power draw, possibly from not having been completely shut off after the previous game session. Special Agent Brady took a baseline reading immediately after turning the systems on, a second reading as the games warmed up during the pre-game movie, and a third when the games reached full power, at the beginning of play.

A reading was taken at the half-hour point in the game session, and again at the end of an hour, before the games were powered down. The intrepid Brady took a final reading five minutes after completely shutting down the consoles. Once more, the consoles seemed to be drawing a tiny amount of power.

Watt-hours (Wh) consumed during one-hour play session, multiplied by 676 hours playing time



per year (based on 13 hours weekly average):

- Console 1 - 185 Wh or 125 kWh
- Console 2 - 98 Wh or 66 kWh
- Console 3 - 17 Wh or 11.5 kWh

### The verdict

Special Agent Brady found evidence that some systems use significantly more energy than others. Even so, the total energy consumption over a year seemingly points to a misdemeanor, rather than a felony—until you factor in the monitor's energy use. If the gamer is using a flat-screen television, a few hours of play can quickly escalate into a high crime. Also, leaving the game in "idle" mode for hours on end to save a gaming session or download a DLC (DownLoadable Content on the Internet) consumes almost as much power as active play. If there is more than one gamer in the house, the electricity use—and dollars—can really add up.

As Brady will attest, every gamer has a preference, and a favorite game may not be available for the most

efficient console. However, there are steps everyone can take to keep video games from committing grand theft electricity:

- Most important of all, turn off the system completely after playing. According to eHow.com, you can save up to \$134 a year if you use a PlayStation, and \$12 a year if you use a Wii.
- Plug the system into a power strip that will power down the game automatically if you forget.
- Invest in a remote power control device that can turn off the game remotely.

Here are some more energy-saving tips from eHow.com:

- If your system has a power saver mode, enable it and make a habit of saving your game whenever you stop playing.
- Don't use your gaming console to watch movies—DVD players use less energy.
- Look for new consoles with energy-saving features like auto-

See INVESTIGATION page 8

# Training opportunities announced for August

**W**estern is co-sponsoring two events in August to shake you out of your late-summer daze and get your wheels turning: “Renewables for Schools,” Aug. 25, and “Advances in Water Heating Technologies,” Aug. 31.

## Targeting utility staff

School districts everywhere are installing, or at least considering installing, renewable energy systems as a way to reduce operating costs, and those that haven't thought about it might if they knew more about the benefits. Utility professionals seeking to encourage schools in their service territory to adopt renewable energy should sign up for the webinar “Renewables for Schools,” 10 a.m. to noon MDT. This event is free to Western customers, and a cost of \$50 to others.

Lower electric bills are only one of the advantages renewable energy offers schools, but installing a system is a significant investment. This webinar will give pointers on communicating the benefits of a variety of renewable systems to educators and their communities. A wind turbine or solar panel is a great tool for teaching science, and can also be incorporated into lessons on geography, economics and social studies. Students get to discover a field that offers future job opportunities, and communities can take pride in generating some of their own power.

“Renewables for Schools” is an overview of renewable opportunities, rather than a “how-to” for project development. In addition to wind and solar systems, the agenda will also touch on geothermal power and



**At the May water heater workshop, Energy Services Representative Jim Bach (left) talks with Michael Racculia of GE, while Josh Schafner of Capital Electric examines the new GE heat pump water heater. (Photo by Erin Huntimer, Basin Electric Power Cooperative)**

power production from biomass.

Although the webinar is intended for utility professionals, teachers, school administrators and other interested individuals are welcomed to attend. However, people who are not in the utility industry may prefer to wait for a Sept. 22 webinar, which will focus specifically on answering educators' questions.

## DSM Tech: Water heaters

The latest in the Demand-side Management (DSM) Technologies Workshop series, “Advances in Water Heating Technologies” is being presented by Tri-State Generation and Transmission Association at its Westminster, Colo., headquarters.

Participants can expect a comprehensive overview of current water heating technology. The many recent improvements in water heaters have created opportunities for utilities to incorporate the appliance into load management programs, noted Katherine Johnson of Johnson Consulting Group. “This is especially true of heat-pump water heaters,” she added. Johnson will be presenting case studies from utilities

that have built successful DSM programs around water heaters.

Basin Electric Power Cooperative hosted a water heating workshop in May that drew more than 30 participants in person, and about 20 online attendees. “It was the first time we did a DSM Technology Workshop as a webcast, and it allowed people from outside the area to attend,” said Chad Reisenauer.

The key accounts and energy conservation coordinator said that Basin members really needed the exposure to heat pump water heating technology. “The presentations got into the meat of how the units operate and how to install them,” Reisenauer explained. “A couple of heaters were brought on site so attendees could look them over and ask specific questions.”

As with past DSM technology workshops, the agenda will include technology demonstrations and have a local focus. Regional representatives from Rheem/Marathon, General Electric Appliances and UMC (formerly known as Utility Marketing Concepts) will make presentations. Paul Steffes, president of Steffes Corp.,

*See TRAINING OPPORTUNITIES page 6*

**Want to know more?**  
**Visit [www.wapa.gov/es/pubs/esb/2010/aug/aug103.htm](http://www.wapa.gov/es/pubs/esb/2010/aug/aug103.htm)**

## Technology Spotlight:

# Using RCMs to implement energy-efficiency technologies

*You may wonder how an article about people and programs snuck into this Technology Spotlight column. It's no mistake. Even tried and true, cost-effective energy-saving technologies such as T-8 lamps and electronic ballasts have alarmingly low adoption rates—often because no one is designated to implement them. This article offers one solution being used, especially by public facilities.*

**S**o many utility customers—school districts, local governments, universities and others—have been unable to implement even simple energy-efficiency improvements with short paybacks. The reason is often a lack of availability of qualified staff. Everyone is so busy taking care of business (accounting tasks, teaching, meetings, maintenance, whatever) that no one has the availability, expertise and interest in systematically investigating and capitalizing on such opportunities. Especially in tough economic times, many organizations feel unable to justify the expense of hiring someone to accomplish this. However, this cautious fiscal approach may be a false economy.

One potential solution is a resource conservation manager (RCM). This person helps a facility reduce operating costs, increase efficiency and promote environmentally friendly operations.

An RCM program is a coordinated effort to manage the resources and services used—and waste generated—by the facility. It involves carefully tracking resources and monitoring operational efficiency. The program focuses on occupant comfort, cost-effectiveness and assuring that equipment is used only when needed. Operational savings are gained through organization, analysis and communication. As the program

manager identifies cost-effective projects and engages building occupants, the public sees responsible use of resources. The organization is able to leverage its in-house efforts to make the most of financial assistance programs.

With a comprehensive RCM program in place, a facility can expect to see quantifiable results within the first six months. Most RCM programs achieve 8 to 10 percent savings on utility bills after the first year, depending on the number of facilities involved and level of management commitment. In the right circumstances, the program's energy savings more than cover the salary of the manager.

## A role for utilities

Even as public-sector budgets shrink, RCM programs are cropping up in some organizations, both large and small, particularly in school districts and local governments. Many of these new RCM programs are supported by utility incentive assistance to cover the start-up costs.

Utilities seeking to stimulate energy savings among their customers would do well to consider promoting (and financially supporting) the formation of resource conservation manager programs. Focus on the larger school districts, local govern-

ments, colleges, universities and other utility customers with enough buildings and energy use to make the investment worthwhile. Once kick-started, the program will hopefully operate for years and deliver an excellent return on investment.

## More information

The WSU Extension Energy Program offers additional information to help you start your successful resource conservation management program, or contact Western's Energy Experts hotline at 800-769-3756. ⚡

## Training opportunities

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will talk about his company's recent projects teaming wind energy with electric thermal storage.

## Register today

So wrap up your summer by taking in some new ideas. "Advances in Water Heating Technology" is free to Western customers and Tri-State customers; there is a \$100 fee for non-customers to attend. Register online for the water heater technology workshop.

"Renewables for Schools" is free to Western customers and \$50 for non-customers. Contact Guy Nelson at 541-994-4670 to register. ⚡

**Want to know more?**  
Visit [www.wapa.gov/es/pubs/esb/2010/aug/aug104.htm](http://www.wapa.gov/es/pubs/esb/2010/aug/aug104.htm)

## Website of the month:

# Weatherization Assistance Program Technical Assistance Center

**F**ew measures offer the bang for your efficiency buck that weatherization does, making the Weatherization Assistance Program Technical Assistance Center (WAPTAC) an indispensable resource for utility professionals who develop programs to help low-income customers.

WAPTAC serves as a virtual library for DOE's Weatherization Assistance Program (WAP), created in 1976 to assist low-income families who lacked resources to invest in energy efficiency. Visitors will find presentation materials, photos and videos of work in progress, site demonstrations and news articles, along with rules, regulations, policies and procedures the program requires.

## Getting to know WAP

Start with WAP Basics to learn how the program works and what it can do for your low-income customers. The document library contains comprehensive references on every aspect of WAP, or you can download the briefing book to cover the essentials. Utilities or municipalities involved in a Recovery Act weatherization program can find tools and templates and success stories from across the nation to help make their program a success.

Since WAP began in 1976, the program has moved from focusing on heating and cooling energy conservation to looking at houses and communities as systems. The whole house approach addresses comprehensive household energy use, as well as related health and safety improvements. The whole-community approach turns weatherization providers into a resource

for community-based efforts to conserve energy, boost economic activity and improve the environment.

This evolution is described in WAP Plus, a subcommittee formed to increase the consistency of quality weatherization services delivered to low-income homes. The subcommittee worked with the Weatherization Trainers Consortium to compile a set of core competencies designed to increase awareness and raise expectations in the program. Drawn from weatherization training center curricula and state technical program standards, this document can help program managers identify weatherization vendors.

## Building workforce

The core competencies are one of the training resources WAPTAC offers for program managers who don't have a local pool of qualified providers. The list of training facilities and training opportunities can connect programs with workers, or help new and experienced workers develop their job skills.

If your local community colleges and weatherization professionals want to conduct training, they can download course materials for workshops from training tools. Funding is available from DOE to support training for state and local weatherization workers and program staff.

## State-of-the-art tools

The tools and techniques weatherization professionals use have improved over the years, and WAPTAC has adopted these advances to get the best results for program investments.

The program recognizes the energy audit as the first step toward making a



home more efficient and comfortable. This section includes audit priority checklists from different state programs, links to audit standards, reference guides for auditing equipment and guidelines for auditing different types of facilities.

Visitors can access the Weatherization Assistant, an energy audit software tool Oak Ridge National Laboratory developed for WAP. The program contains the National Energy Audit Tool (NEAT) for site-built single-family houses and the Manufactured Home Energy Audit (MHEA) for mobile homes.

## Program support

A program can only help its target audience if they know about it. Use resources from WAP's public information campaign to spread the word that weatherization works. Learn how to talk to the media about weatherization, stage site demonstrations,

*See WEBSITE OF THE MONTH page 8*



## Fowler, Colo. *from page 2*

town, where the median income is about \$26,000. “The city is a state Enterprise Zone, so we can offer some incentives that other places might not be able to,” Snider explained.

A production facility that brings in 160 jobs would be a big coup for a town with a population of only 1,200.

## Small town triumphs

At first glance, it seems surprising that a town the size of Fowler is embracing innovation so thoroughly. It could be that, buffeted by urban migration and hard economic times, rural towns now find they have the most to gain and the least to lose by trying something new. Snider said that the only town he was aware of that had more ambitious plans than Fowler was Greensburg, Kan., forced to rebuild from the ground

up after a devastating 2007 tornado.

On the other hand, there is a tradition in agricultural communities of understanding how to work with the land, not against it, and of making the most of your circumstances. Perhaps the real secret to Fowler’s vision—and the key to its green future—are in the last words of the motto of Fowler State Bank, run by the same family for three generations: waste nothing. ⚡

Want to know more?

Visit [www.wapa.gov/es/pubs/esb/2010/aug/aug101.htm](http://www.wapa.gov/es/pubs/esb/2010/aug/aug101.htm)

## Investigation

*from page 4*

save games, auto-power down features and a sleep button on the game controller.

## Epilogue

Although most of the findings did not surprise Brady—“I’ve seen our electric bill,” he admitted—our special agent became more aware of

the different aspects of energy use. “Playing isn’t the only way gaming uses electricity,” he explained. “When you download a game over the Internet, it can take hours, and the computer or system has to be on the whole time. Imagine thousands of people downloading those games. The energy use is amazing.”

Brady also enjoyed getting experience with the auditing tools, and presenting his poster at the

Utility Energy Forum. “People were very interested in my presentation, and it was great to be able to discuss ideas with professionals who do these things for a living,” he said.

Download the fact sheet, Video Games: Energy Heist?, or contact the Equipment Loan Program to borrow tools for your own investigation. Then let us know what you find. If we all work together, we can stamp out energy waste. ⚡

Want to know more?

Visit [www.wapa.gov/es/pubs/esb/2010/aug/aug102.htm](http://www.wapa.gov/es/pubs/esb/2010/aug/aug102.htm)

## Website of the month *from page 7*

organize Weatherization Day (Oct. 30) in your community and more.

Outreach doesn’t end with a completed project. Under Energy Education, visitors will find resources to communicate to homeowners how these weatherization modifications to his or her home work, so

that maximum energy savings can be achieved.

As with any Federal program, WAP is governed by various regulations to help manage and account for the resources provided by DOE. The website posts program guidance documents dating from the most current, back to 1993, along with rules and regulations for program administrators.

Weatherization is a big topic, so even with all the resources on the WAPTAC website, you may still have questions about the program. Ask the Experts to get answers about specific questions, and check the WAP Blog and message board regularly to learn from other program managers. ⚡

Want to know more?

Visit [www.wapa.gov/es/pubs/esb/2010/aug/aug105.htm](http://www.wapa.gov/es/pubs/esb/2010/aug/aug105.htm)